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[54] **DEVICE FOR LOCAL DRUG DELIVERY AND METHODS FOR USING THE SAME**

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Related U.S. Application Data

[63] Continuation of Ser. No. 188,248, Jan. 28, 1994, Pat. No. 5,523,092, which is a continuation-in-part of Ser. No. 46,622, Apr. 14, 1993, Pat. No. 5,399,352.

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[52] **U.S. Cl.** **424/423**; 604/96; 604/101; 604/264; 604/280; 604/281

[58] **Field of Search** 424/423; 604/96, 604/101, 264, 280, 281

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,256,146 10/1993 Ensminger et al. 604/104

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[57] **ABSTRACT**

A device for the local delivery of a substance into a natural tissue conduit in the mammalian body. The device has a substance delivery segment which provides a means for locally delivering a substance into the boundary layer of fluid flowing through the conduit without disrupting the fluid flow therethrough. For example, an indwelling catheter is provided for endovascular delivery of a substance locally to a targeted treatment area. Also provided are methods of locally delivering a substance into a natural tissue conduit in the mammalian body utilizing the device of the present invention.

48 Claims, 5 Drawing Sheets